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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/988,891	11/19/2001	Leslie L. Deck	09712-099001 / Z-204	9186
26161	7590	09/23/2004	EXAMINER	
FISH & RICHARDSON PC 225 FRANKLIN ST BOSTON, MA 02110			TURNER, SAMUEL A	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/988,891	<b>Applicant(s)</b> DECK, LESLIE L.	
	<b>Examiner</b> Samuel A. Turner	<b>Art Unit</b> 2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 14 June 2004.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 15-19, 25-33 and 35 is/are rejected.
- 7) ☒ Claim(s) 10-14, 20-24, and 34 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

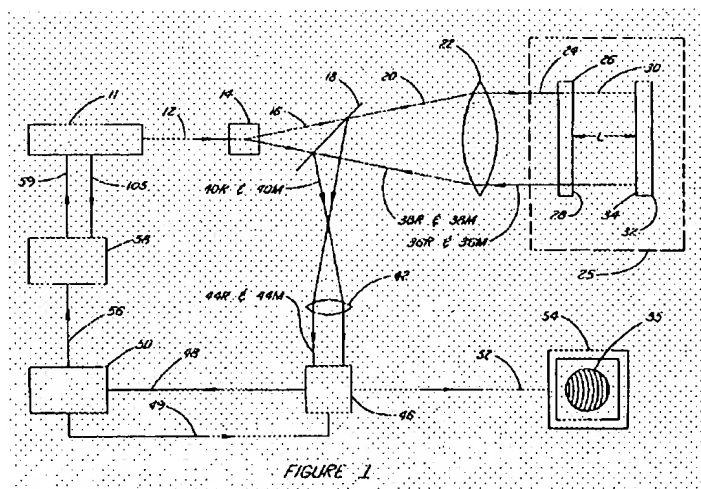
**DETAILED ACTION*****Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

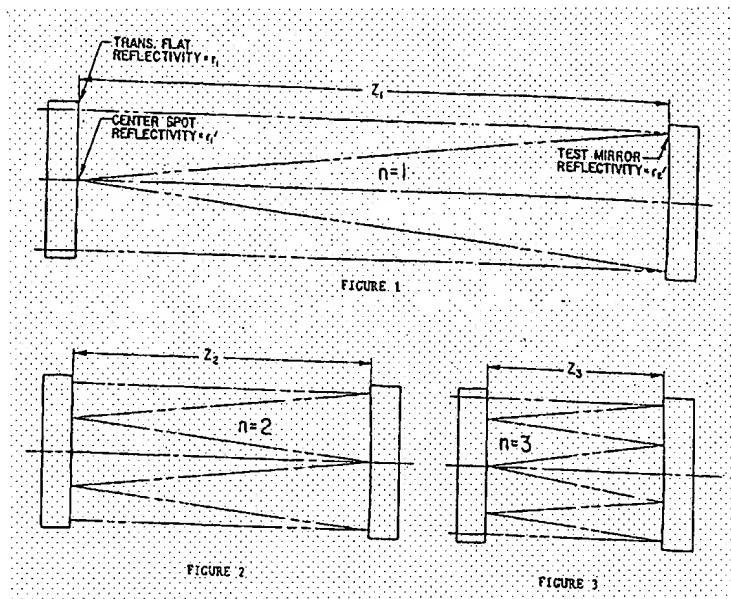
Claims 1-9, 15-19, 25-33, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sommargren(4,594,003) in view of Gerchman et al(SPIE-192).

Sommargren teaches a tunable laser source(11), an unequal path interferometer(25), detector array(46), and a system controller(50). See figure 1. The type of interferometer taught by Sommargren is known as a Fizeau, common path, or unequal path interferometer. This arrangement is used to measure the surface profile of flat, and spherical-type objects under test. See column 3, lines 50+ of Sommargren.



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Gerchman et al teach a Fizeau interferometer having successive null orders in the retroreflecting cavity in order to measure very long radius of curvature surfaces. See figures 1-3.



It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Sommargren apparatus by replacing the Fizeau cavity(50) with the Fizeau cavity of Gerchman in order to measure very long radius of curvature surfaces. This provides the advantage of varying the phase difference between the test and reference wavefronts by modulating the interference pattern by a known amount, found in Sommargren, and thus provides for a more accurate measure of distance at each point of the detected interference patterns enhancing the radius of curvature measurements from the teachings of Gerchman.

*Response to Arguments*

Applicant's arguments filed 14 June 2004 have been fully considered but they are not persuasive in regard to the remaining rejected claims.

With regard to claims 1-9, 15, and 16; Sommargren teach that the Fizeau configuration is applicable to both planer and spherical objects and includes aspherical shapes by use of a holographic reference surface, see column 3, lines 51+. By profiling a spherical shape the curvature and thus the radius can be directly derived by the skilled artisan.

With regard to claims 17-19; It is clear from figure 2a of Sommargren that the diode laser's second face is used via the detector(102) to derive a feedback signal(105) which reads on the "wavelength change monitor".

With regard to claims 25-33, and 35; the "phase variation" is caused by the profile of the shape under test while the "change in frequency" is due to the pattern modulation by a known amount due to the change in wavelength.

Claims 10-14, 20-24, and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant's arguments with regard to "a wavelength change monitor configured to monitor changes in the characteristic wavelength of the radiant energy source, wherein said system controller is arranged to receive output from the wavelength change monitor and is programmed to calculate the radius of curvature of the

surface of the measurement object from a monitored change in the wavelength and the monitored optical interference pattern” is found persuasive in that the wavelength change monitor is connected to the system controller and the radius interference pattern and the monitored change in the wavelength.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel A. Turner whose phone number is **571-272-2432**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr., can be reached on **571-272-2800 ext. 77**.

The fax phone number for the organization where this application or proceeding is assigned is **703-872-9306**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see **<http://pair-direct.uspto.gov>**. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at **866-217-9197** (toll-free).



Samuel A. Turner  
Primary Examiner  
Art Unit 2877